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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,181	12/28/2001	Owen John Williams Wynn		9418

7590 08/26/2005  
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260 Bear Hill Road  
Waltham, MA 02451-1018

EXAMINER
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THANGAVELU, KANDASAMY

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 08/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/034,181	WYNN, OWEN JOHN WILLIAMS	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kandasamy Thangavelu	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-8 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

PD

### **DETAILED ACTION**

1. Claims 1-8 of the application have been examined.

#### ***Foreign Priority***

2. Acknowledgment is made of applicant's claim for foreign priority based on an application 0100097.5 filed in UK on January 3, 2001. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Drawings***

3. The drawings submitted on December 28, 2001 are accepted.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

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5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Turner et al.** (U.S. Patent 6,437,759) in view of **Amery et al.** (U.S. Patent 6,152,739), and further in view of **Covannon et al.** (U.S. Patent 6,543,899).

6.1 **Turner et al.** teaches vehicle simulator having head-up display. Specifically, as per claim 1, **Turner et al.** teaches a vehicle simulator (Abstract, L1-3; CL1, L7-8); comprising:

(iii) an image projector for being mounted on a head or headwear of the operator (CL1, L16-18; Fig. 4);

(iv) a head position and orientation system mounted on the head or the headwear of the operator (Abstract, L3-6; CL1, L7-8);

(v) a simulator host computer that receives information from controls of the vehicle and sends information to the controls and to instruments of the vehicle when the vehicle is in a simulation mode (CL3, L51-56);

(vi) an image generator computer (Abstract, L6-8; Fig. 4), that receives data from the simulator host computer regarding the vehicle's simulated position and orientation (CL1, L13-16;

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CL3, L51-56; CL1, L20-21); and that also receives data from the head position and orientation sensing system regarding the operator's head position and orientation (Abstract, L8-10; CL2, L63-65; CL4, L59-63); and that sends a computed image to the image projector (Abstract, L6-8, Fig. 4).

**Turner et al.** does not expressly teach (i) a real-world vehicle whose controls and instruments are dual-mode such that they can be switched between normal operation and simulated operation. **Amery et al.** teaches (i) a real-world vehicle whose controls and instruments are dual-mode such that they can be switched between normal operation and simulated operation (CL1, L40-47), because that allows providing inputs to the visual display system in simulation mode in response to the displayed video images; the operator can simulate the flight of an aircraft and can respond to the environment as depicted by the visual display (CL1, L40-47). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the vehicle simulator of **Turner et al.** with the vehicle simulator of **Amery et al.** that included (i) a real-world vehicle whose controls and instruments were dual-mode such that they could be switched between normal operation and simulated operation. The artisan would have been motivated because that would allow providing inputs to the visual display system in simulation mode in response to the displayed video images; the operator could simulate the flight of an aircraft and could respond to the environment as depicted by the visual display.

**Turner et al.** does not expressly teach (ii) a retro-reflecting screen which is deployed around and outside windows of a control area of the vehicle, which control area is for a person

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operating the simulator. **Covannon et al.** teaches (ii) a retro-reflecting screen which is deployed around and outside windows of a control area of the vehicle, which control area is for a person operating the simulator (CL1, L6-8; CL2, L23-24), because the retro-reflective screen uses reflection rather than diffraction, allowing the screen to function properly with multicolor and full color images (CL2, L33-36). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the vehicle simulator of **Turner et al.** with the vehicle simulator of **Covannon et al.** that included (ii) a retro-reflecting screen which was deployed around and outside windows of a control area of the vehicle, which control area was for a person operating the simulator. The artisan would have been motivated because the retro-reflective screen would use reflection rather than diffraction, allowing the screen to function properly with multicolor and full color images.

6.2 As per claim 3, **Turner et al.**, **Amery et al.** and **Covannon et al.** teach the vehicle simulator of claim 1. **Turner et al.** teaches that the real-world vehicle is an aircraft, in which the operator is a pilot, and in which the control area is a cockpit of the aircraft (CL, L10; CL1, L16-18; CL1, L43).

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Turner et al.** (U.S. Patent 6,437,759) in view of **Amery et al.** (U.S. Patent 6,152,739), and further in view of **Covannon et al.** (U.S. Patent 6,543,899) and **Huston et al.** (U.S. Patent 6,361,321).

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7.1 As per claim 2, **Turner et al.**, **Amery et al.** and **Covannon et al.** teach the vehicle simulator of claim 1. **Turner et al.** does not expressly teach that the real-world vehicle is a road vehicle, in which the operator is a driver, and in which the control area is a cab of the road vehicle. **Huston et al.** teaches that the real-world vehicle is a road vehicle, in which the operator is a driver, and in which the control area is a cab of the road vehicle (Abstract, L1-9; CL1, L12-16; CL1, L63 to CL2, L7), because that allows accurately simulating driving a vehicle in various weather and traffic conditions by an operator such as a driver testee (CL1, L14-16; CL2, L1-3). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the vehicle simulator of **Turner et al.** with the vehicle simulator of **Huston et al.** that included the real-world vehicle being a road vehicle, in which the operator was a driver, and in which the control area was a cab of the road vehicle. The artisan would have been motivated because that would allow accurately simulating driving a vehicle in various weather and traffic conditions by an operator such as a driver testee.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Turner et al.** (U.S. Patent 6,437,759) in view of **Amery et al.** (U.S. Patent 6,152,739), and further in view of **Covannon et al.** (U.S. Patent 6,543,899), **Larussa** (U.S. Patent 6,163,408) and **Pollack** (U.S. Patent 6,106,298).

8.1 As per claim 5, **Turner et al.**, **Amery et al.** and **Covannon et al.** teach the vehicle simulator of claim 1. **Turner et al.** does not expressly teach that the realworld vehicle is a ship or a boat, in which the operator is a pilot, and in which the control area is a bridge or cockpit of

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the ship or boat. **Larussa** teaches that the realworld vehicle is a ship or a boat, in which the operator is a pilot, and in which the control area is a bridge or cockpit of the ship or boat (CL10, L9-13), because as per **Pollack** that allows training operators of the ship and other sea vessels (CL1, L11-17). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the vehicle simulator of **Turner et al.** with the vehicle simulator of **Larussa** that included the realworld vehicle being a ship or a boat, in which the operator was a pilot, and in which the control area was a bridge or cockpit of the ship or boat. The artisan would have been motivated because that would allow training operators of the ship and other sea vessels.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Turner et al.** (U.S. Patent 6,437,759) in view of **Amery et al.** (U.S. Patent 6,152,739), and further in view of **Covannon et al.** (U.S. Patent 6,543,899) and **Streid** (U.S. Patent 6,196,845).

9.1 As per claim 6, **Turner et al.**, **Amery et al.** and **Covannon et al.** teach the vehicle simulator of claim 1. **Turner et al.** does not expressly teach that the image projector has a small exit pupil such that its depth of field at various distances from the retro-reflecting screen is sufficient to prevent de-focus of the picture as the operator looks around. **Streid** teaches that the image projector has a small exit pupil such that its depth of field at various distances from the retro-reflecting screen is sufficient to prevent de-focus of the picture as the operator looks around (CL3, L58-61), because that allows viewing the imagery with a full depth focus (CL3, L60-61). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention



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to modify the vehicle simulator of **Turner et al.** with the vehicle simulator of **Streid** that included the image projector having a small exit pupil such that its depth of field at various distances from the retro-reflecting screen was sufficient to prevent de-focus of the picture as the operator looked around. The artisan would have been motivated because that would allow viewing the imagery with a full depth focus.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Turner et al.** (U.S. Patent 6,437,759) in view of **Amery et al.** (U.S. Patent 6,152,739), and further in view of **Covannon et al.** (U.S. Patent 6,543,899) and **Shaffer et al.** (U.S. Patent 6,050,690).

10.1 As per claim 7, **Turner et al.**, **Amery et al.** and **Covannon et al.** teach the vehicle simulator of claim 1. **Turner et al.** does not expressly teach that the image projector includes an auto-focus mechanism for maintaining focus as the projection distance varies. **Shaffer et al.** teaches that the image projector includes an auto-focus mechanism for maintaining focus as the projection distance varies (CL3, L58-61), because that allows the remote viewer to input control information and automatically focus a portion of the displayed image (CL1, L65-66; CL2, L6-7). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the vehicle simulator of **Turner et al.** with the vehicle simulator of **Shaffer et al.** that included the image projector including an auto-focus mechanism for maintaining focus as the projection distance varied. The artisan would have been motivated because that would allow the remote viewer to input control information and automatically focus a portion of the displayed image.

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Turner et al.** (U.S. Patent 6,437,759) in view of **Amery et al.** (U.S. Patent 6,152,739), and further in view of **Covannon et al.** (U.S. Patent 6,543,899) and **Blackham** (U.S. Patent 6,735,015).

11.1 As per claim 8, **Turner et al.**, **Amery et al.** and **Covannon et al.** teach the vehicle simulator of claim 1. **Turner et al.** teaches a small high-resolution projector (CL4, L1-2). **Turner et al.** does not expressly teach that the projector is a small high-resolution flat panel display projector. **Amery et al.** teaches that the projector is a small high-resolution flat panel display projector (CL2, L35-37; CL4, L57-58), because as per **Blackham** the flat panel LCD displays are attractive because of their reduced system maintenance, versatile lens options and small physical size and weight for a given light output (CL3, L1-5). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the vehicle simulator of **Turner et al.** with the vehicle simulator of **Amery et al.** that included the projector being a small high-resolution flat panel display projector. The artisan would have been motivated because the flat panel LCD displays would be attractive because of their reduced system maintenance, versatile lens options and small physical size and weight for a given light output.

*Allowable Subject Matter*

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12. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard, can be reached on 571-272-3749. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'K. Thangavelu', with a stylized flourish at the end.

K. Thangavelu  
Art Unit 2123  
August 20, 2005